

What is claimed is:

Sub A3) 1. A polynucleotide comprising a sequence encoding a functional vesicular fusion factor 2 protein (Vff2p), or a structural or functional homolog of Vff2p.

Sub B1) 2. The polynucleotide of claim 1, wherein the Vff2p is a yeast protein involved in the secretory pathway and/or involved in the required cellular machinery for membrane fusion.

Sub B1) 3. The polynucleotide of claim 1, wherein the Vff2p comprises SEQ ID NO:2.

4. The polynucleotide of claim 1, comprising SEQ ID NO:1.

5. The polynucleotide of claim 1, wherein the protein is about 32 kD.

Sub A4) 6. The polynucleotide of claim 1, further comprising a first promoter operatively linked to the sequence encoding the Vff2p.

7. The polynucleotide of claim 6 wherein the first promoter is a promoter that functions in a host cell to direct transcription of the sequence encoding the Vff2p.

8. The polynucleotide of claim 1, further comprising a sequence encoding a target protein.

9. The polynucleotide of claim 8, further comprising a sequence encoding the target protein operably linked to a second promoter.

10. The polynucleotide of claim 9, wherein the second promoter is a promoter that functions in the host cell to direct transcription of the target protein.

11. The polynucleotide of claim 7, wherein the host cell is a yeast cell.

SuB A5 ~~12. The polynucleotide of claim 2, wherein the yeast is a *Saccharomyces cerevisiae*, *Schizosaccharomyces pombe*, *Yarrowia lipolytica*, *Pichia pastoris*, *Hansenula polymorpha*, or *Kluyveromyces lactis*.~~

~~13. A polynucleotide expression vector comprising a polynucleotide encoding a functional Vff2p, or a structural or functional homolog of Vff2p.~~

SuB 4 → 14. The expression vector of claim 13, where in the Vff2p comprises SEQ ID NO:2.

15. The expression vector of claim 13, comprising SEQ ID NO:1.

16. The expression vector of claim 13, wherein the protein is about 32 kD.

SuB A6 ~~17. The expression vector of claim 13, further comprising a first promoter sequence operatively linked to the sequence encoding the Vff2p.~~

~~18. The expression vector of claim 17 wherein the first promoter is a promoter that functions in a host cell to direct transcription of the sequence encoding the Vff2p.~~

~~19. The expression vector of claim 13, further comprising a sequence encoding a target protein.~~

20. The expression vector of claim 19, wherein transcription of the target protein is directed by a second promoter.

21. The expression vector of claim 20, wherein the second promoter is a promoter that functions in the host cell to direct transcription of the target protein.

22. The expression vector of claim 18, wherein the host cell is a yeast cell.

Sub B6 23. The expression vector of claim 22, wherein the protein is from *Saccharomyces cerevisiae*, *Schizosaccharomyces pombe*, *Yarrowia lipolytica*, *Pichia pastoris*, *Hansenula polymorpha*, or *Kluyveromyces lactis*.

Sub A7 24. A recombinant host cell comprising a cell genetically altered to express a protein encoded by a polynucleotide sequence encoding a functional Vff2p, or a structural or functional homolog of Vff2p.

Sub B7 25. The host cell of claim 24, wherein the Vff2p comprises SEQ ID NO:2.

- 26. The host cell of claim 24, comprising SEQ ID NO:1.

Sub A8 27. The host cell of claim 25, further comprising a sequence encoding a target protein.

~~28. The host cell of claim 24, wherein the host cell is a yeast cell.~~

Sub B8 29. The host cell of claim 28, wherein the yeast cell is a *Saccharomyces cerevisiae*, *Schizosaccharomyces pombe*, *Yarrowia lipolytica*, *Pichia pastoris*, *Hansenula polymorpha*, or *Kluyveromyces lactis* cell.

Sub A

30. The host cell of claim 28, wherein the host cell lacks a functional protein involved in the secretory pathway and/or involved in the required cellular machinery for membrane fusion, other than Vff2p.

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31. A method for increasing protein production in a cell, comprising introducing Vff2p to a host cell.

32. The method for increasing protein production in a cell according to claim 31, wherein a polynucleotide encoding Vff2p is introduced into the host cell and thereafter, culturing the host cell under conditions effective to allow expression of the encoded Vff2p.

Sub A

33. A method for increasing protein secretion from a cell, comprising introducing Vff2p to a host cell.

34. The method for increasing protein secretion from a cell according to claim 33, wherein a polynucleotide encoding Vff2p is introduced into the host cell and thereafter, culturing the host cell under conditions effective to allow expression of the encoded Vff2p.

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35. An isolated functional vesicular fusion factor 2 protein.

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36. The protein of claim 35 having an amino acid sequence essentially corresponding to SEQ ID NO:2.

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37. A method of selecting for a yeast secretory mutant cell containing a polynucleotide sequence encoding a Vff2p, or a structural or functional homolog of Vff2p, operably linked to a first promoter, the method comprising growing the recombinant cell at a temperature of about 32-37°C.

38. The method of claim 37, wherein the temperature is at about 37°C.
39. The method of claim 37, wherein the secretory mutant cell is sec17-1, sec18-1, bet1-1, sec22-2, uso1-1, pex3-1, sed5-1, cdc48-2, sec7-5, or ypt1-3.28.
40. The method of claim 39, wherein the secretory mutant cell is sec17-1, sec18-1, bet1-1, sec22-2, uso1-1, or pex3-1.
41. The method of claim 40, wherein the secretory mutant cell is sec18-1.

sus A² 42. The method of claim 37, wherein the polynucleotide further comprises a sequence encoding a target protein operably linked to a second promoter.

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